

FIG. 1

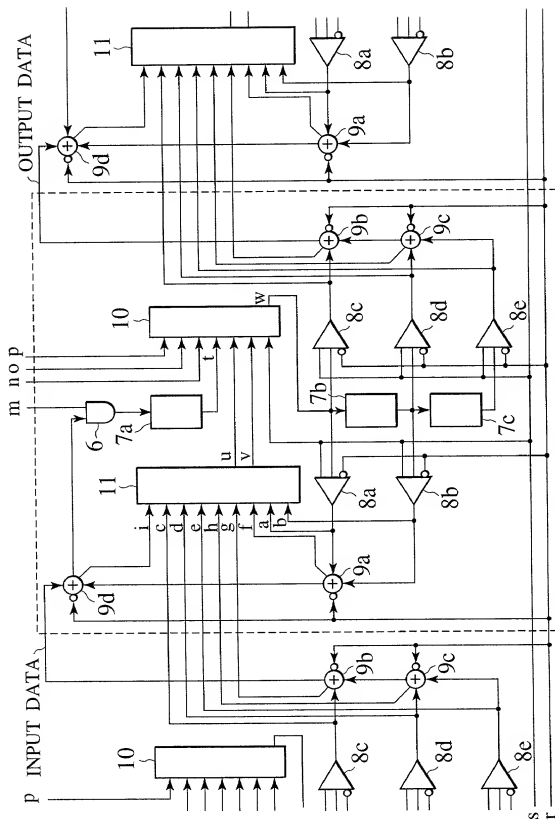


FIG.2

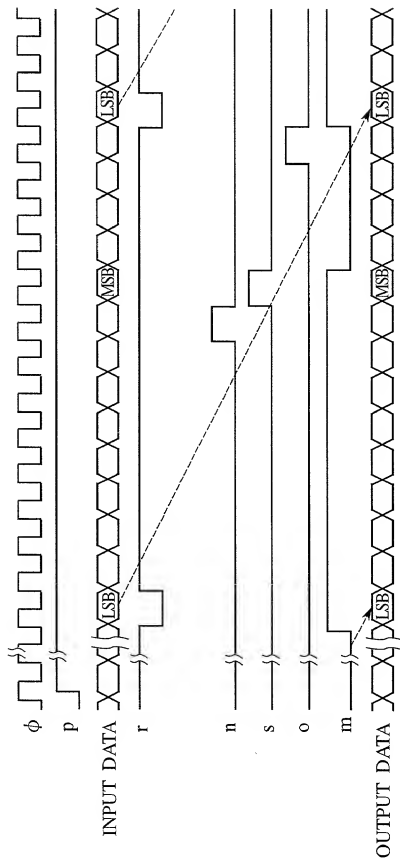


FIG.3(a)

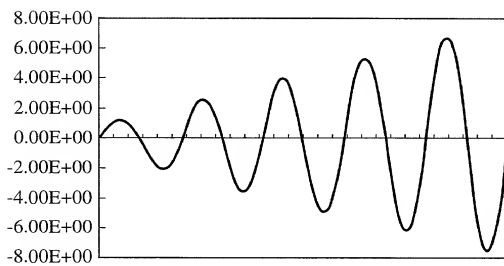


FIG.3(b)

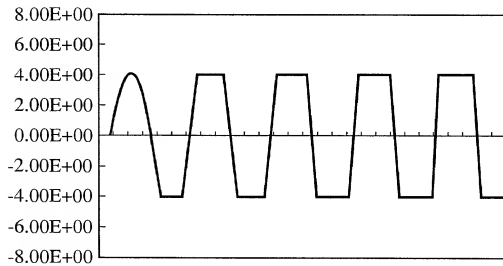


FIG.4

| INTERMEDIATE SUM S |    |    |    | TRUE SUM Z=S-5 |    |    |    | SIGN | CONDITION |   |          |
|--------------------|----|----|----|----------------|----|----|----|------|-----------|---|----------|
| S3                 | S2 | S1 | S0 | Z3             | Z2 | Z1 | Z0 |      |           |   |          |
| 0                  | 0  | 0  | 0  | (0)            | 1  | 0  | 1  | 1    | (-5)      | - | OVERFLOW |
| 0                  | 0  | 0  | 1  | (1)            | 1  | 1  | 0  | 0    | (-4)      | - | OVERFLOW |
| 0                  | 0  | 1  | 0  | (2)            | 1  | 1  | 0  | 1    | (-3)      | - | OVERFLOW |
| 0                  | 0  | 1  | 1  | (3)            | 1  | 1  | 1  | 0    | (-2)      | - | OVERFLOW |
| 0                  | 1  | 0  | 0  | (4)            | 1  | 1  | 1  | 1    | (-1)      | - |          |
| 0                  | 1  | 0  | 1  | (5)            | 0  | 0  | 0  | 0    | (0)       | + |          |
| 0                  | 1  | 1  | 0  | (6)            | 0  | 0  | 0  | 1    | (1)       | + | OVERFLOW |
| 0                  | 1  | 1  | 1  | (7)            | 0  | 0  | 1  | 0    | (2)       | + | OVERFLOW |
| 1                  | 0  | 0  | 0  | (8)            | 0  | 0  | 1  | 1    | (3)       | + | OVERFLOW |
| 1                  | 0  | 0  | 1  | (9)            | 0  | 1  | 0  | 0    | (4)       | + | OVERFLOW |

FIG. 5

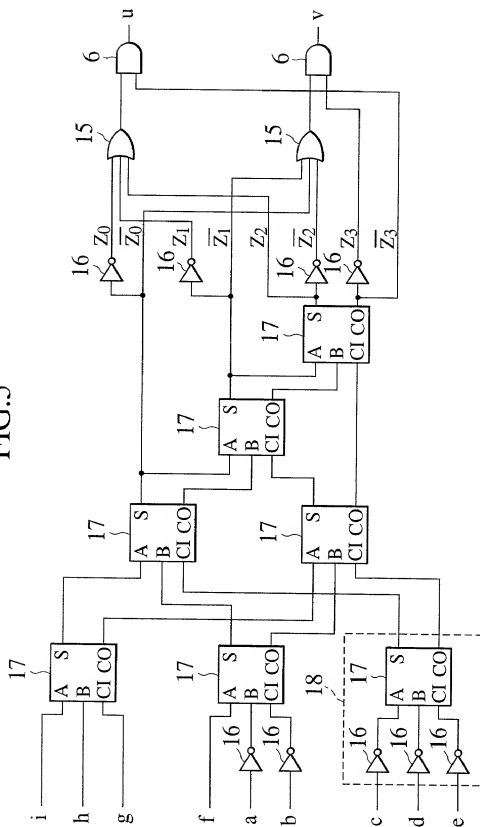


FIG. 6

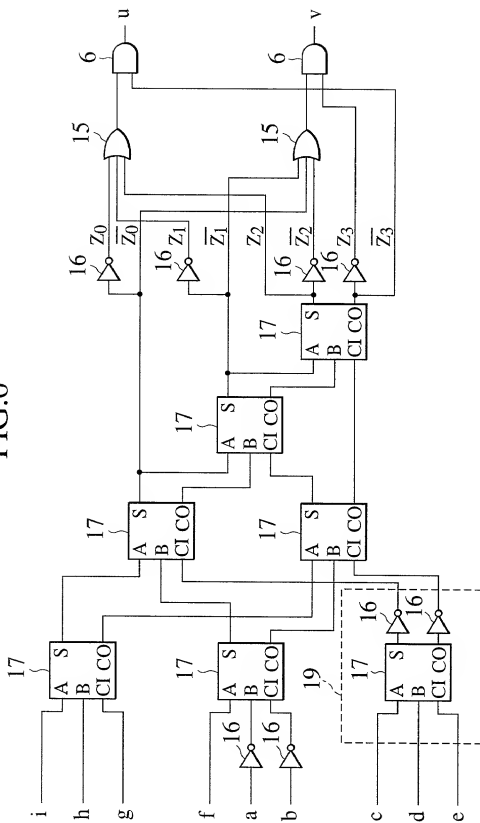


FIG. 7

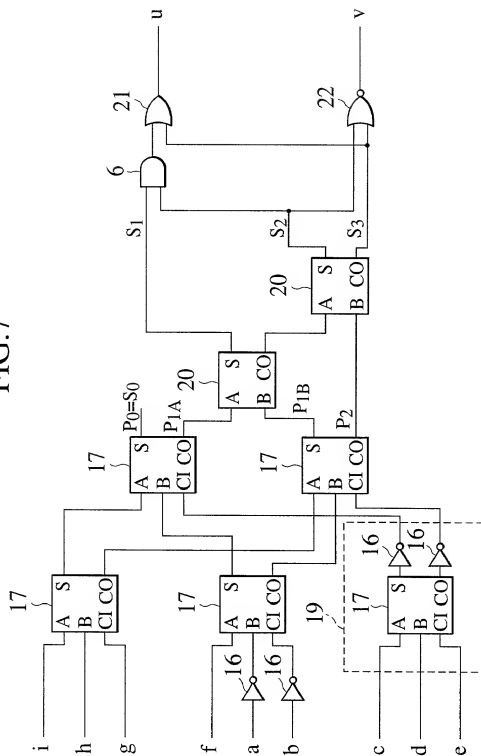


FIG.8

| INTERMEDIATE SUM S' | TRUE SUM Z=4-S' | SIGN | CONDITION |
|---------------------|-----------------|------|-----------|
| S3' S2' S1' S0'     | Z3 Z2 Z1 Z0     |      |           |
| 0 0 0 0 (0)         | 0 1 0 0 (4)     | +    | OVERFLOW  |
| 0 0 0 1 (1)         | 0 0 1 1 (3)     | +    | OVERFLOW  |
| 0 0 1 0 (2)         | 0 0 1 0 (2)     | +    | OVERFLOW  |
| 0 0 1 1 (3)         | 0 0 0 1 (1)     | +    | OVERFLOW  |
| 0 1 0 0 (4)         | 0 0 0 0 (0)     | +    |           |
| 0 1 0 1 (5)         | 1 1 1 1 (-1)    | -    |           |
| 0 1 1 0 (6)         | 1 1 1 0 (-2)    | -    | OVERFLOW  |
| 0 1 1 1 (7)         | 1 1 0 1 (-3)    | -    | OVERFLOW  |
| 1 0 0 0 (8)         | 1 1 0 0 (-4)    | -    | OVERFLOW  |
| 1 0 0 1 (9)         | 1 0 1 1 (-5)    | -    | OVERFLOW  |



FIG. 9

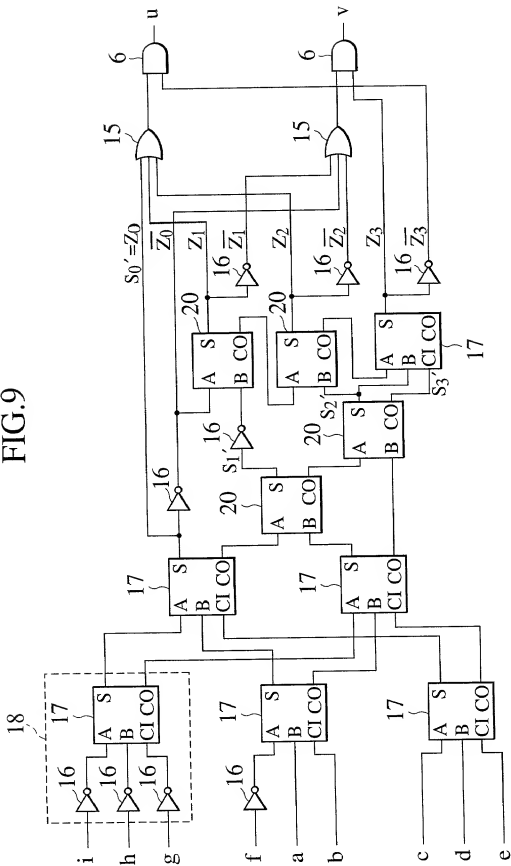


FIG.10

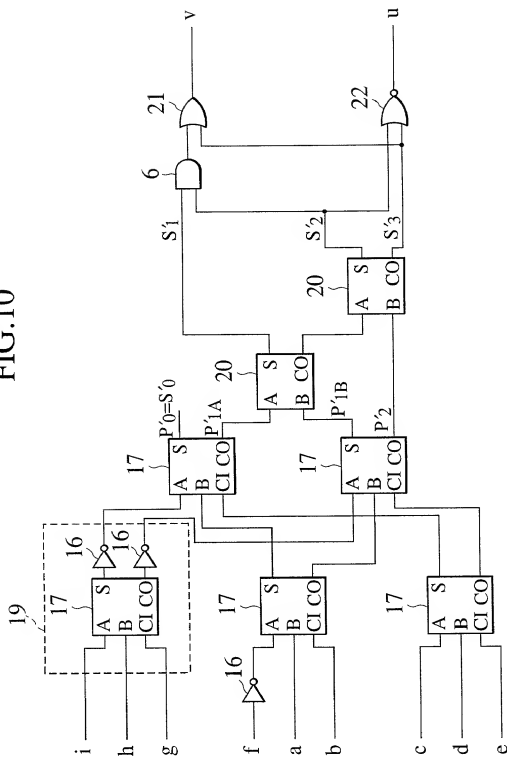


FIG.11

| REDUNDANT<br>BINARY | INTERMEDIATE<br>SUM S | TRUE SUM<br>Z=S-5 | SIGN | CONDITION |
|---------------------|-----------------------|-------------------|------|-----------|
| P2 P1B P1A P0       |                       |                   |      |           |
| 0 0 0 0             | 0000 (0)              | 1011 (-5)         | -    | OVERFLOW  |
| 0 0 0 1             | 0001 (1)              | 1100 (-4)         | -    | OVERFLOW  |
| 0 0 1 0             | 0010 (2)              | 1101 (-3)         | -    | OVERFLOW  |
| 0 0 1 1             | 0011 (3)              | 1110 (-2)         | -    | OVERFLOW  |
| 0 1 0 0             | 0010 (2)              | 1101 (-3)         | -    | OVERFLOW  |
| 0 1 0 1             | 0011 (3)              | 1110 (-2)         | -    | OVERFLOW  |
| 0 1 1 0             | 0100 (4)              | 1111 (-1)         | -    |           |
| 0 1 1 1             | 0101 (5)              | 0000 (0)          | +    |           |
| 1 0 0 0             | 0100 (4)              | 1111 (-1)         | -    |           |
| 1 0 0 1             | 0101 (5)              | 0000 (0)          | +    |           |
| 1 0 1 0             | 0110 (6)              | 0001 (1)          | +    | OVERFLOW  |
| 1 0 1 1             | 0111 (7)              | 0010 (2)          | +    | OVERFLOW  |
| 1 1 0 0             | 0110 (6)              | 0001 (1)          | +    | OVERFLOW  |
| 1 1 0 1             | 0111 (7)              | 0010 (2)          | +    | OVERFLOW  |
| 1 1 1 0             | 1000 (8)              | 0011 (3)          | +    | OVERFLOW  |
| 1 1 1 1             | 1001 (9)              | 0100 (4)          | +    | OVERFLOW  |

FIG.12

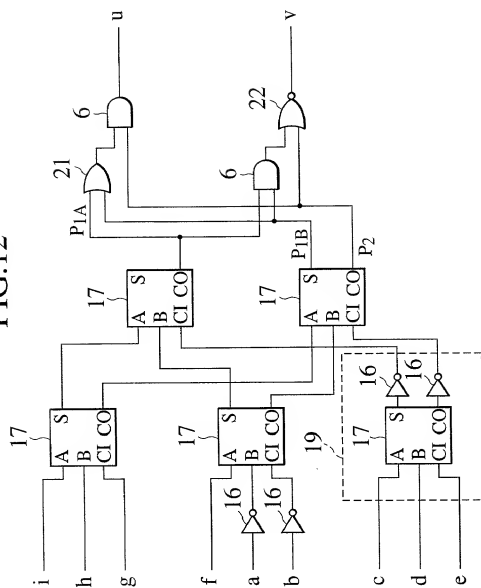


FIG.13

| REDUNDANT<br>BINARY<br>P2' P1B' P1A' P0' | INTERMEDIATE<br>SUM S' | TRUE SUM<br>Z=4-S' | SIGN | CONDITION |
|--|------------------------|--------------------|------|-----------|
| 0 0 0 0                                  | 0 0 0 0 (0)            | 0 1 0 0 (4)        | +    | OVERFLOW  |
| 0 0 0 1                                  | 0 0 0 1 (1)            | 0 0 1 1 (3)        | +    | OVERFLOW  |
| 0 0 1 0                                  | 0 0 1 0 (2)            | 0 0 1 0 (2)        | +    | OVERFLOW  |
| 0 0 1 1                                  | 0 0 1 1 (3)            | 0 0 0 1 (1)        | +    | OVERFLOW  |
| 0 1 0 0                                  | 0 0 1 0 (2)            | 0 0 1 0 (2)        | +    | OVERFLOW  |
| 0 1 0 1                                  | 0 0 1 1 (3)            | 0 0 0 1 (1)        | +    | OVERFLOW  |
| 0 1 1 0                                  | 0 1 0 0 (4)            | 0 0 0 0 (0)        | +    |           |
| 0 1 1 1                                  | 0 1 0 1 (5)            | 1 1 1 1 (-1)       | -    |           |
| 1 0 0 0                                  | 0 1 0 0 (4)            | 0 0 0 0 (0)        | +    |           |
| 1 0 0 1                                  | 0 1 0 1 (5)            | 1 1 1 1 (-1)       | -    |           |
| 1 0 1 0                                  | 0 1 1 0 (6)            | 1 1 1 0 (-2)       | -    | OVERFLOW  |
| 1 0 1 1                                  | 0 1 1 1 (7)            | 1 1 0 1 (-3)       | -    | OVERFLOW  |
| 1 1 0 0                                  | 0 1 1 0 (6)            | 1 1 1 0 (-2)       | -    | OVERFLOW  |
| 1 1 0 1                                  | 0 1 1 1 (7)            | 1 1 0 1 (-3)       | -    | OVERFLOW  |
| 1 1 1 0                                  | 1 0 0 0 (8)            | 1 1 0 0 (-4)       | -    | OVERFLOW  |
| 1 1 1 1                                  | 1 0 0 1 (9)            | 1 0 1 1 (-5)       | -    | OVERFLOW  |

FIG.14

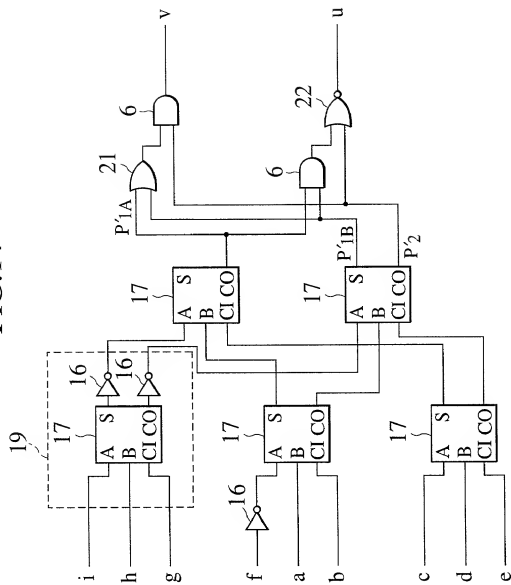


FIG.15

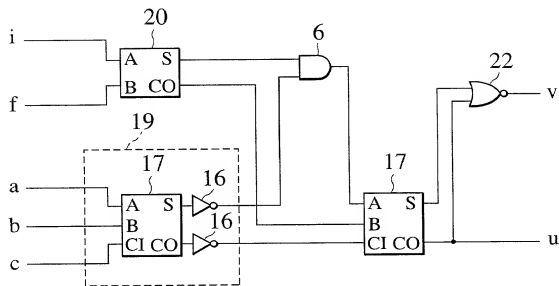


FIG.16

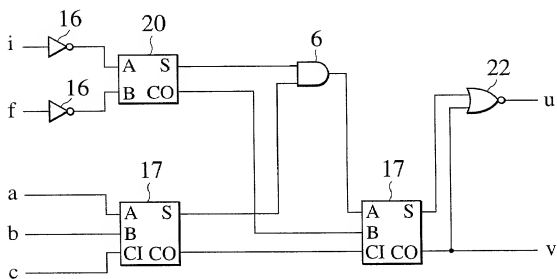






FIG. 19

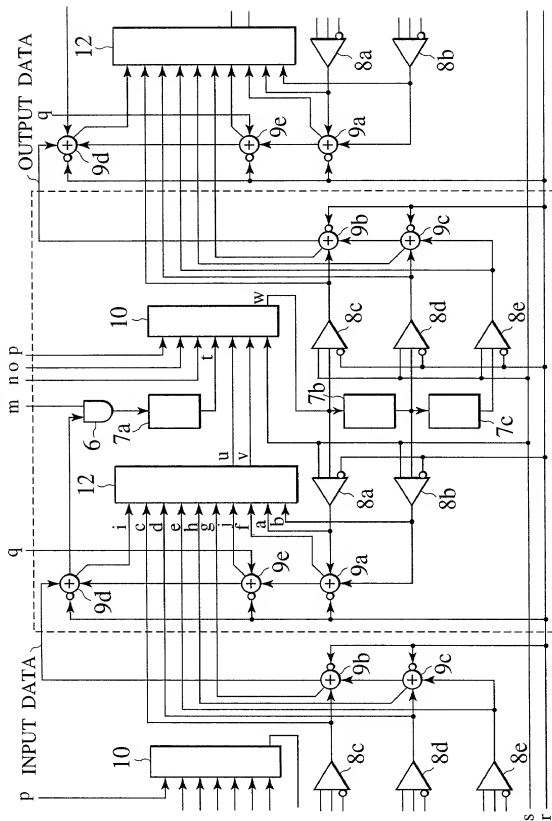


FIG.20

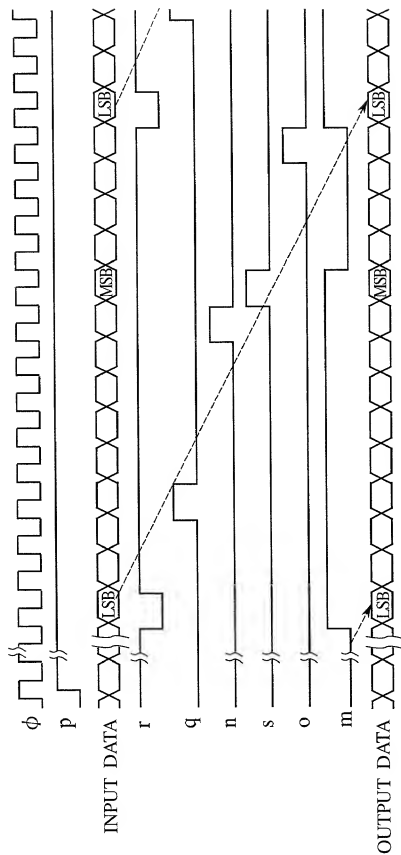


FIG.21

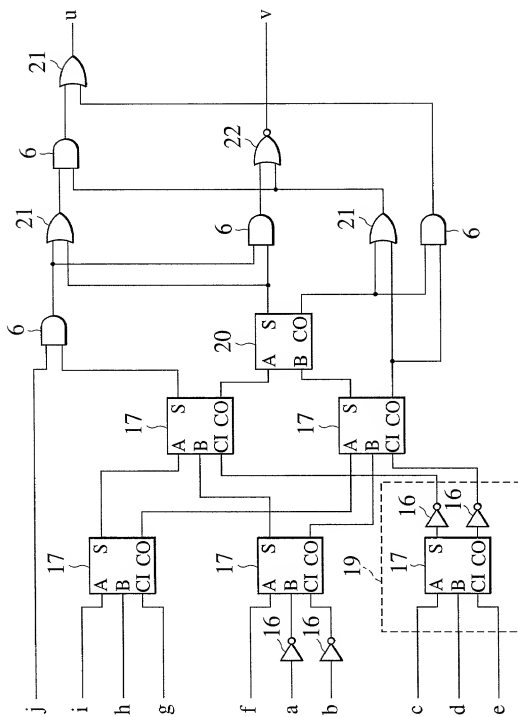


FIG.23

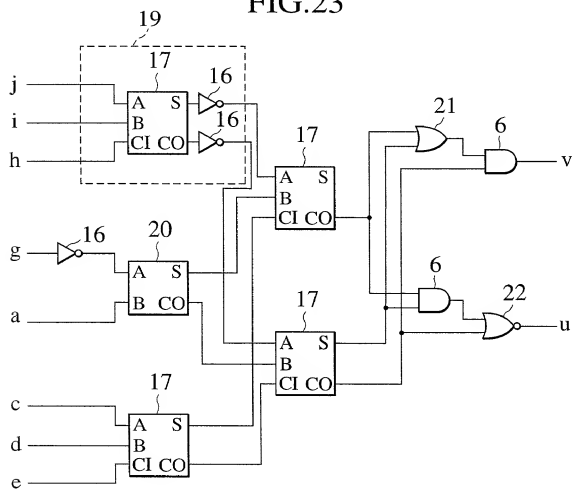


FIG.24

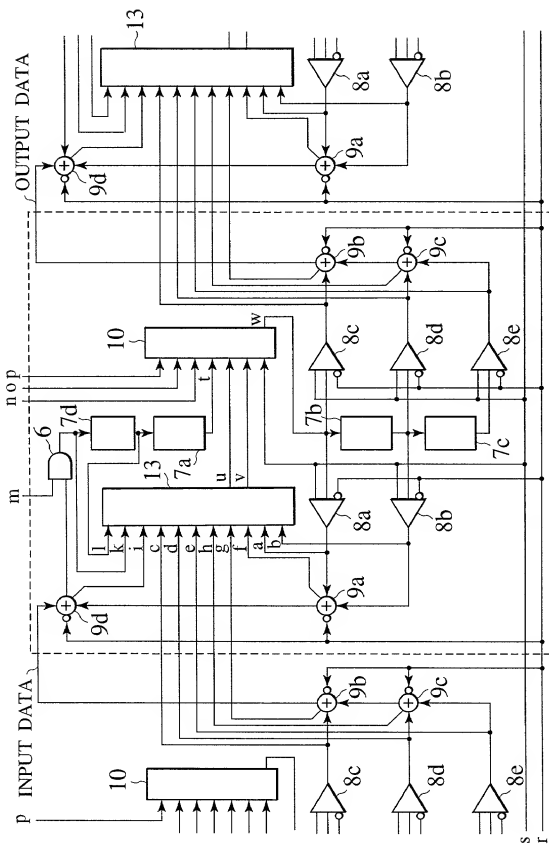


FIG.25

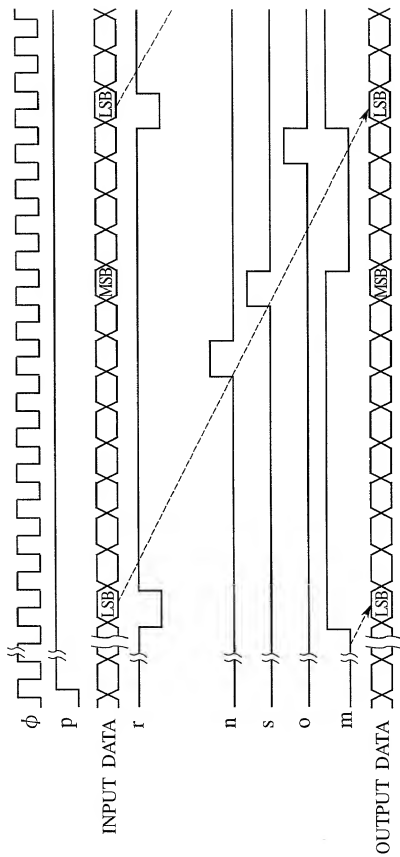


FIG.26

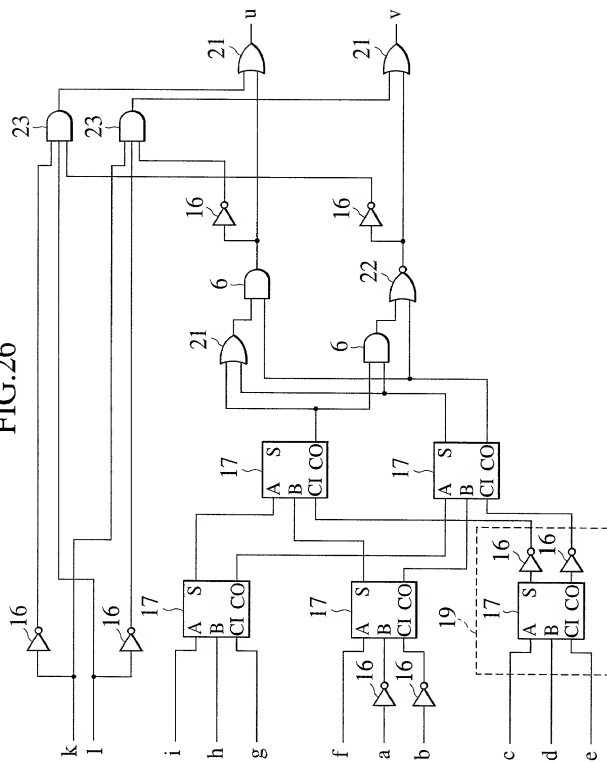


FIG.27

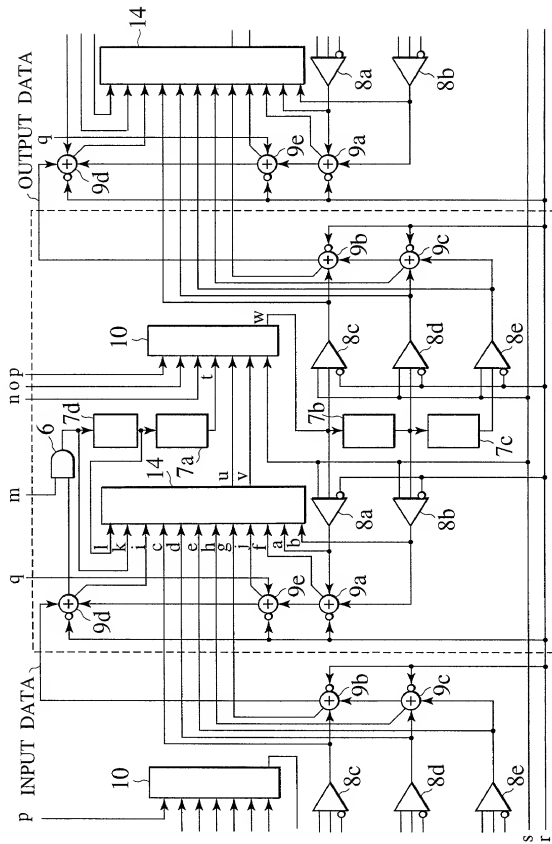




FIG.28

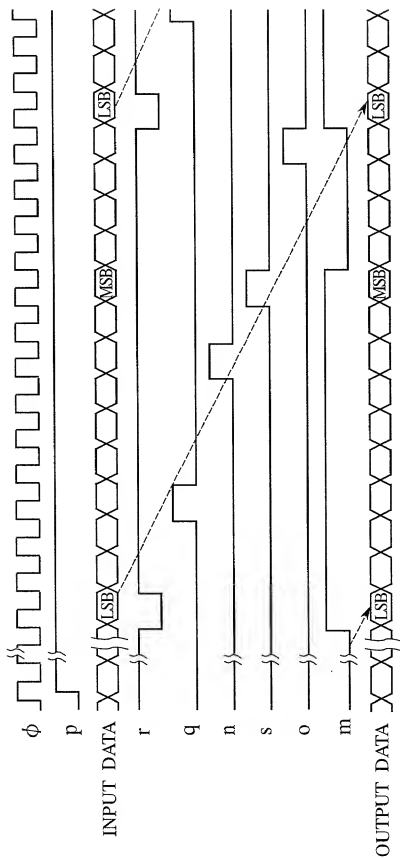


FIG.29

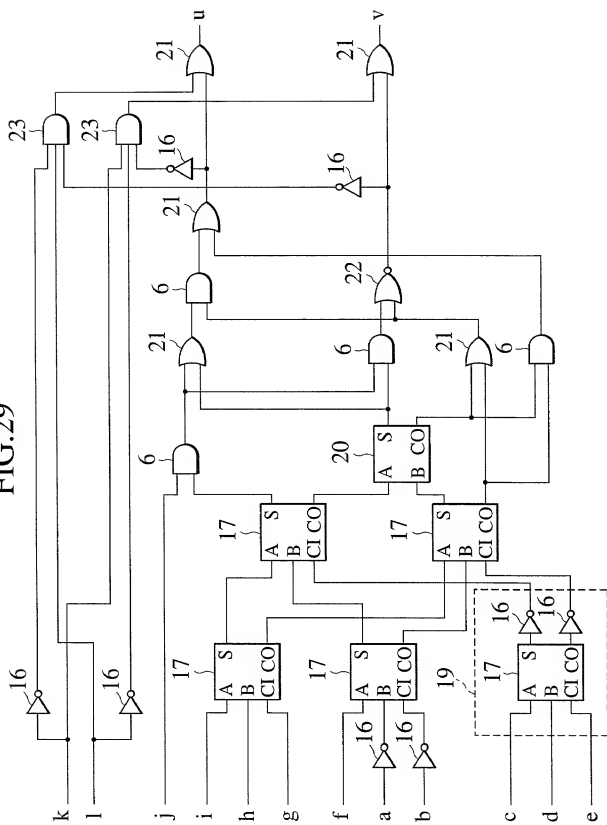


FIG.30

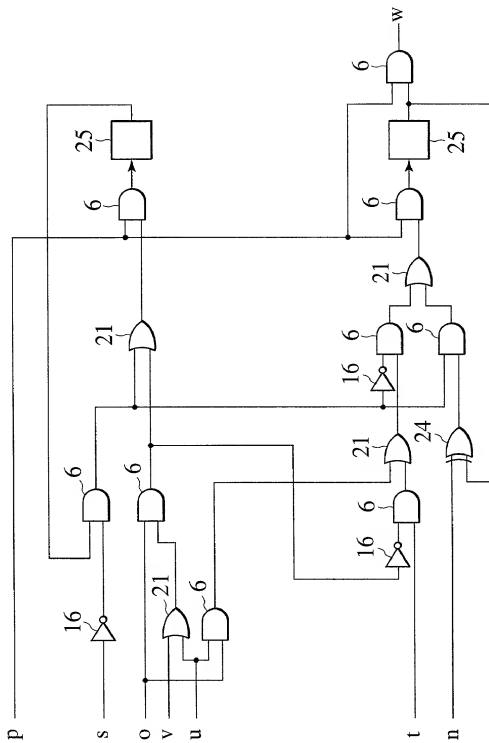


FIG. 31

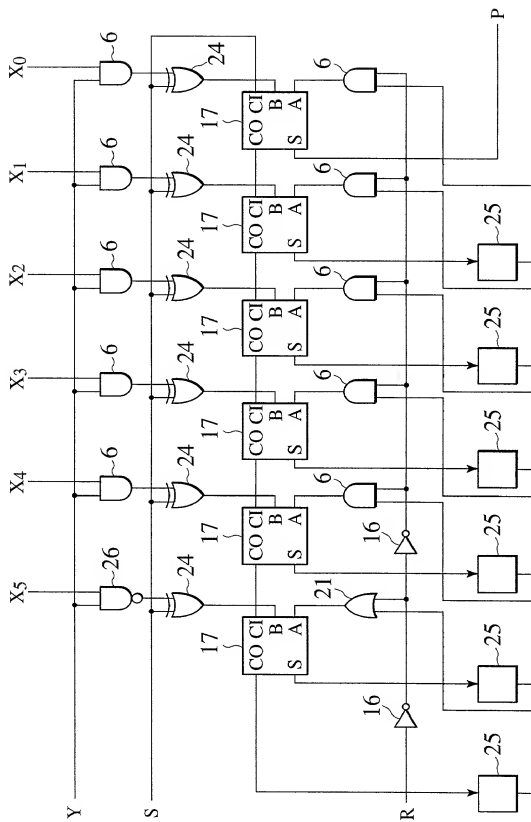


FIG.32

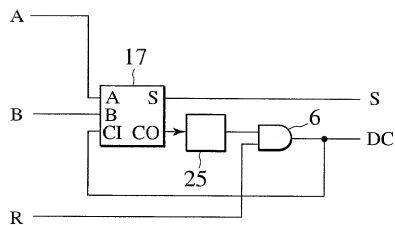


FIG.33

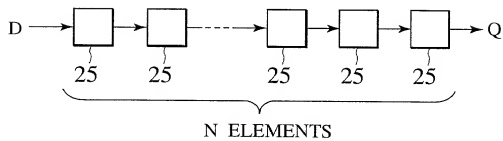


FIG.34

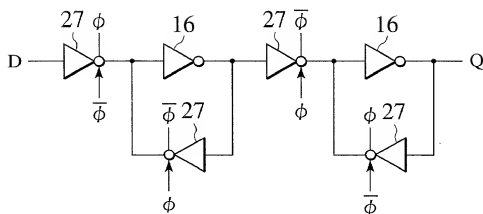


FIG.35

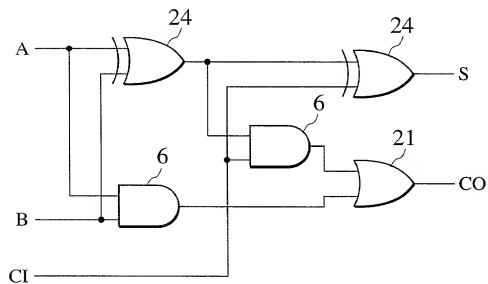


FIG.36

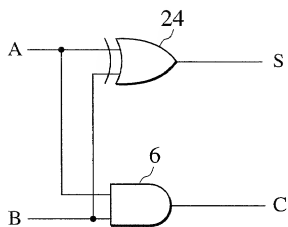






FIG.38

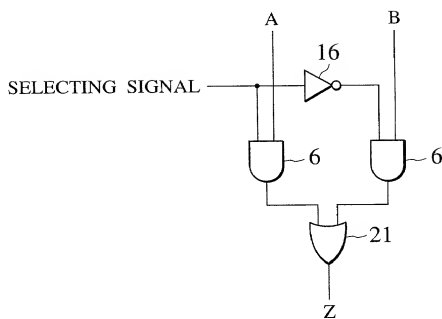


FIG.39(a)

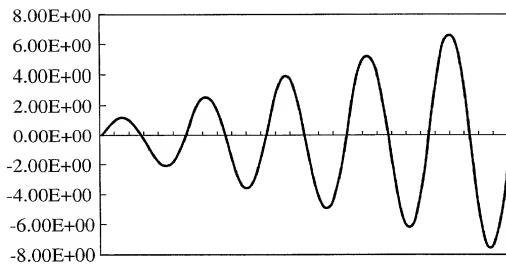


FIG.39(b)

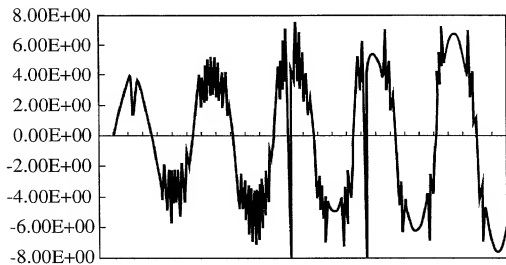


FIG.40(a)

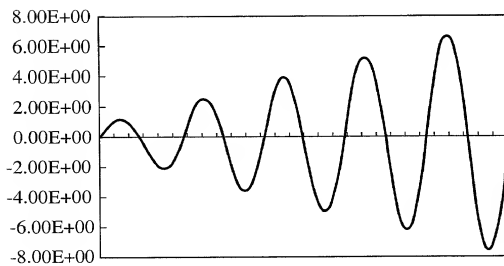


FIG.40(b)

